

DETAILED ACTION

Specification

The following guidelines illustrate the preferred layout for the specification of a utility application. These guidelines are suggested for the applicant's use.

Arrangement of the Specification

As provided in 37 CFR 1.77(b), the specification of a utility application should include the following sections in order. Each of the lettered items should appear in upper case, without underlining or bold type, as a section heading. If no text follows the section heading, the phrase "Not Applicable" should follow the section heading:

- (a) TITLE OF THE INVENTION.
- (b) CROSS-REFERENCE TO RELATED APPLICATIONS.
- (c) STATEMENT REGARDING FEDERALLY SPONSORED RESEARCH OR DEVELOPMENT.
- (d) THE NAMES OF THE PARTIES TO A JOINT RESEARCH AGREEMENT.
- (e) INCORPORATION-BY-REFERENCE OF MATERIAL SUBMITTED ON A COMPACT DISC.
- (f) BACKGROUND OF THE INVENTION.
 - (1) Field of the Invention.
 - (2) Description of Related Art including information disclosed under 37 CFR 1.97 and 1.98.
- (g) BRIEF SUMMARY OF THE INVENTION.
- (h) BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWING(S).
- (i) DETAILED DESCRIPTION OF THE INVENTION.
- (j) CLAIM OR CLAIMS (commencing on a separate sheet).
- (k) ABSTRACT OF THE DISCLOSURE (commencing on a separate sheet).
- (l) SEQUENCE LISTING (See MPEP § 2424 and 37 CFR 1.821-1.825. A "Sequence Listing" is required on paper if the application discloses a nucleotide or amino acid sequence as defined in 37 CFR 1.821(a) and if the required "Sequence Listing" is not submitted as an electronic document on compact disc).

Drawings

Figures 1A and 1B should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). Corrected drawings in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Objections

Claim 14 is objected to because of the following informalities: In lines 2 - 3 of claim 14, "the lens-coil combination" appears to need a change to -- a lens-coil combination --. Appropriate correction is required.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1 - 5, 7, and 9 – 14 are rejected under 35 U.S.C. 102(b) as being anticipated by Block et al. (United States Patent US 6,162,590), hereinafter referenced as Block.

Regarding claim 1, Block discloses a method for making an optical or magneto-optical head which reads on the method of manufacturing an integrated magneto-optical element for use in a magneto-optical write and/or read head claimed. Block discloses "A method of manufacturing an integrated magneto optical element for use in a magneto-optical write and/or read head" (column 1, lines 49 - 50 'A method for manufacturing a magneto-optic or optical disk head'), "forming a thin-film in-plane magnetic coil (106) in or on a transparent substrate (109)" (column 16, claim 27, lines 29 - 30 'forming a plurality of electrically conductive coils on said substrate for generating a magnetic field', lines 27 - 28 "a transparent substrate", and lines 42 - 43 'plating said coils onto the exposed portions of said plating base' (Notice that the plated coils are of a thin-film and in-plane construction.)), "forming on said substrate (109) an objective lens (114)" (column 16, lines 27 - 28 'forming a plurality of diffractive lenses on a transparent substrate').

Regarding claim 2, Block discloses everything claimed as applied above (see claim 1), in addition, Block discloses "wherein said objective lens (114) has relatively very high numerical aperture (NA)" (column 8, lines 36 - 39 'Lens 16 can be designed to give high numerical apertures (i.e., N.A.) which will also decrease the diameter of the Airy spot by decreasing the focal length of the diffractive lens. The effective N.A. of a zone plate may be very high').

Regarding claim 3, Block discloses everything claimed as applied above (see claim 2), in addition, Block discloses "wherein said objective lens (114) has a $NA > 0.85$ " (column 8, lines 39 - 40 'The effective N.A. of a zone plate may be very high, such as

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0.85 to 0.95' (Notice that the disclosed range includes values that are greater than a N.A. of 0.85.)).

Regarding claim 4, Block discloses everything claimed as applied above (see claim 3), in addition, Block discloses "wherein said objective lens (114) has a $NA > 0.9$ " (Specifically, see the argument of claim 3 in regard to Block's disclosure of a N.A. range that includes values greater than 0.9.).

Regarding claim 5, Block discloses everything claimed as applied above (see claim 1), in addition, Block discloses "wherein the thin-film in-plane magnetic coil (106) is formed by deposition or galvanic growth of a layer of conductive material onto the substrate (109)" (column 5, lines 13 - 15 'a plating base layer 52 comprising 15nm thick Cr 52a and 100 nm thick Au 52b is sputtered onto the bottom of substrate 30', lines 26 - 28 'Gold 56 is then plated onto the exposed portion of plating base layer 52 to thereby form gold coils 38', and lines 34 - 36 'coils 38 can be other electrically conductive materials, e.g. copper, and can be formed by methods other than plating, e.g. sputtering and selective etching').

Regarding claim 7, Block discloses everything claimed as applied above (see claim 1), in addition, Block discloses "wherein the magnetic coil (106) comprises at least two layers of conductive material separated by an insulating material" (column 15, lines 5 - 10 'forming an insulating layer over the coils (Notice that the coils form a layer of conductive material.) . . . depositing a conductive layer on the insulating layer and the electrical contact windows for electrically contacting the coils').

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Regarding claim 9, Block discloses everything claimed as applied above (see claim 1), in addition, Block discloses "wherein an array of objective lenses (114) is formed or mounted on a substrate (109) having a plurality of respective magnetic coils (106) provided thereon, and the substrate (109) is then cut into a plurality of lens-coil combinations" (column 18, claim 38, lines 8 - 13 'forming a plurality of blazed zone lenses on said substrate simultaneously; forming a plurality of coils on said substrate simultaneously; and separating said substrate into a plurality of pieces, each piece comprising a blazed zone plate lens and a coil').

Regarding claim 10, Block discloses everything claimed as applied above (see claim 1), in addition, Block discloses "wherein a single lens (114) is mounted or formed on a substrate (109) having a single magnetic coil (106)" (column 6, lines 12 - 15 'While FIGS. 3A to 3E show one head being formed, those skilled in the art will appreciate that the structure of FIGS. 3A to 3E also includes many other identical heads that are simultaneously formed elsewhere on substrate 30' (Notice that a head comprises both a lens and a coil.)).

Regarding claim 11, Block discloses everything claimed as applied above (see claim 1), in addition, Block discloses "An integrated magneto-optical element comprising a thin-film in-plane magnetic coil in or on a transparent substrate (109) and an objective lens (114), the element being manufactured according to claim 1" (Specifically, see the argument of claim 1 in regard to Block's disclosure of a magneto-optic disk head which is manufactured by the disclosed method.).

Regarding claim 12, Block discloses everything claimed as applied above (see claim 1), in addition, Block discloses "A method of manufacturing a magneto-optical write and/or read head, the method including the step of manufacturing an integrated magneto-optical element according to the method of claim 1" (Specifically, see the argument of claim 1 in regard to Block's disclosure of a method for making a magneto-optical head in which a lens and coil combination is used to manufacture a magneto-optic head.).

Regarding claim 13, Block discloses everything claimed as applied above (see claim 12 and claim 1), in addition, Block discloses "A magneto-optical read and/or write head manufactured according to the method of claim 12" (Specifically, see the argument of claim 1 in regard to Block's disclosure of a magneto-optic head that comprises a lens and coil combination which is manufactured by the disclosed method.).

Regarding claim 14, Block discloses everything claimed as applied above (see claim 13), in addition, Block discloses "A magneto-optical write and/or read head according to claim 13, wherein a further lens (116) is provided above the lens-coil combination" (column 3, lines 27 – 29 'FIG. 8 illustrates an embodiment of a magneto-optic disk drive including and axicon lens 116 for enhancing the efficiency of a zone plate lens', and column 7, lines 9 – 10 'An embodiment of head 18 is shown in FIG. 8 with a plane mirror 122, axicon lens 116, and lens 16').

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Block, in view of Penning et al. (United States Patent US 7,027,269 B2), hereinafter referenced as Penning.

Regarding claim 6, Block discloses everything claimed as applied above (see claim 1), however, Block fails to disclose "wherein two or more layers of conductive material are provided on a semiconductor substrate, which is subsequently adhered to a transparent substrate (109)".

In a similar field of endeavor, Penning discloses a method of manufacturing a magnetic head having a planar coil in which conductive layers are formed on top of silicon substrate which is then glued to a glass substrate (column 4, lines 54 - 62 'A first conductive or metallic layer 7a provided with one or more coil turn sections is formed at the first side 5a of the first substrateThereafter, a second conducting layer 7c is formed on the insulating layer 7b', column 4, lines 46 - 48 'a substrate 1 of silicon which substrate 1 may form part of a Si-wafer', and column 5, lines 2 - 5 'the first substrate is adhered, particularly glued, with its first side 5a . . .to a side 9a of a second substrate 9 of e.g. glass').

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the method for making an optical or

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magneto-optical head of Block by specifically using the teachings in Penning to include "wherein two or more layers of conductive material are provided on a semiconductor substrate, which is subsequently adhered to a transparent substrate (109)" because one having ordinary skill in the art would want to form a slider which has a protective layer (Penning, column 3, lines 41 - 44 'The top layer can be an oxide, such as SiO₂ . . . Since the top layer functions a protective layer for the obtained slider').

Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Block, in view of Wang et al. (United States Patent US 6,229,782 B1), hereinafter referenced as Wang.

Regarding claim 8, Block discloses everything claimed as applied above (see claim 1), however, Block fails to disclose "wherein the objective lens (114) is made by one of glass-photopolymer replication techniques, glass moulding or plastic injection moulding".

In a similar field of endeavor, Wang discloses the construction of a lens in a high numerical aperture optical focusing device in which photopolymer deposition and glass molding are utilized (column 7, lines 33 - 38 'A flat glass (or optical) substrate or sheet is molded or pressed either individually, or in batches at a wafer level . . . Other lens shapes, such as the shapes shown and described herein can be formed as well using similar techniques', and lines 49 - 50 'These lens patterns can alternatively be formed, for example, by photopolymer deposition onto the substrate').

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Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the method for making an optical or magneto-optical head of Block by specifically using the teachings in Wang to include "wherein the objective lens (114) is made by one of glass-photopolymer replication techniques, glass moulding or plastic injection molding" because one having ordinary skill in the art would want to use well known and well developed processes to form a lens.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to BRIAN BUTCHER whose telephone number is (571)270-5575. The examiner can normally be reached on Monday – Friday from 6:30 AM to 3:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wayne Young, can be reached at (571) 272 - 7582. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

BMB

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/Wayne Young/

Supervisory Patent Examiner, Art Unit 2627